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ORIGINAL ARTICLES.

ADVANCEMENT OF THE CAPSULE OF TENON IN MARKED CASES OF DIVERGENT SQUINT.*

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The causes of divergent squint are so well known to all of you that it is hardly necessary to mention them all, and in many cases a mild divergence can hardly be named a deformity. It gives the person thus afflicted some times an interesting appearance, and in some families a slight divergence is some times met with where there is perfectly normal vision of both eye, and where this seems to be an inherited condition.

When we have the cases of divergence due to paralysis of the internal recti, and even after most of the other symptoms of the paralysis have disappeared, the divergence may remain as the most annoying symptom. But the most distressing of all cases are those where a convergence *preceded* the divergence, and especially where it follows an operation for convergent squint. However, thanks to more conservative measures employed now in the treatment of convergent squint, operations for its correction are not so frequent as formerly, and as a result failures of squint operations resulting not infrequently in divergence of the eyeball are not so often met

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with as formerly, and consequently these cases of divergent squint are much less frequently met with than twenty or thirty years ago. Yet even now one will see, some times, cases of marked divergence as a result of operations which appeared to be perfectly satisfactory at the time of the operation, and even for many years later, which eventually turn into very marked divergent squint. This may happen even to the best operators, but of course not nearly so often as after operations performed by less experienced surgeons or physicians. Of course such a result is not only mortifying to all parties concerned, but has also brought the operation for convergent squint into discredit by physicians and patients.

As I mentioned before, the early and systematic use of glasses will cure a very large percentage of all cases of strabismus convergens, and then the advancement of the weak muscle will rarely fail to relieve the convergence, and this operation is hardly ever followed by an over-correction and disturbance of the muscular equilibrium. It must likewise be admitted that the tenotomies are now done much more carefully than formerly, and are, as a rule, more successful than they were formerly.

Yet when we meet one of these distressing cases, which, as a rule, are a great deformity, and occur more frequently in adults than in children, we are usually met with the remark that they have had so many operations upon their eyes that they refuse to submit to another, unless we can give them the full assurance that it will be successful. This I had not been able to do until I resorted to the most radical way of treating these cases, and I have been so universally successful that I do not hesitate to promise the patients a complete relief of their deformity.

My plan of treatment has been to make a very free tenotomy of one or both external recti muscles, and in some cases make even a shortening of this muscle by removing a small piece of it, as the first step in the operation, and I have never applied a suture, thinking that the dressing of the eye after the operation will keep the parts in place and prevent all swelling. The next step is to expose the internal rectus. This is usually inserted away back beyond its original point of insertion, or it may be found to be a thin, flabby muscle. After freeing the muscle from all old adhesions, which are sometimes very firm when the divergence came as a result of a tenotomy for convergent squint, I bring it well forward, after separating it from its attachment to the eyeball, take as much of it as I want to remove in my forceps, apply my sutures be-

hind the forceps, usually three in number, and remove this part of the muscle, together with a more or less liberal piece of the capsule of tenon, with the overlying conjunctiva, and advance the remaining parts, which includes the shortened muscle, the capsule of tenon and the conjunctiva, and fasten it to the anterior part of the eyeball as near to the sclero-corneal margin and in as secure a manner as possible.

After cleaning the conjunctival sac carefully, I apply a firm bandage with a small piece of linen smeared with boric acid ointment placed over the closed lids, and over this a moist, soft surgeon's sponge; over this a moderately thick layer of absorbent cotton, and over this the bandage. As a rule I do not remove the bandage in forty-eight hours. This firm yet elastic pressure, prevents all swelling of the parts and aids the sutures in keeping the parts perfectly quiet until firm union has taken place. The bandage must be renewed several times during the following four or six days, when, as a rule, the union of the parts is so firm that dark glasses may now be used until the eye is ready for the correcting glasses. The sutures may be removed much later, unless they cause much irritation and annoyance. Granulations will sometimes start in the wound, but this is not so frequent an occurrence in the wound over the external recti, even if no stitches had been used here.

The following cases have been taken at random from my case book, and in all of them many months have passed, and still the results are as good as can be desired:

Case I. Miss H., age 19, Northampton, Mass. Strabismus divergens, 0.5.

The left eye has been a poorer eye, as long as she can remember, at one time was convergent, then it became straight, and for two or three years there was hardly anything abnormal to be seen, but for the last five or six years the eye began to turn out, and this has gradually increased to such an extent that the white of the eyeball has become so prominent that it is very embarrassing for her to go out, or to go to any place of amusement, because the people look at her. She is otherwise a very pretty girl, and enjoys excellent health. The fundus of the eye is healthy.

An advancement of the capsule of tenon, including the shortened rectus internus and conjunctiva, was made and the external rectus freely tenotomized at the same time. The stitches were removed only a few weeks after the operation, and the result was at once very satisfactory. Correcting glasses were worn for more than a

year, but she gradually used them less and less, and now she has discarded them entirely. She got married since, and there is no trace of the former opacity nor any sign of the operation present.

Case II. Mr. G. H., 28 years of age, of Washington, D. C., a druggist by profession.

When a lad ten years of age the right eye was operated upon for convergent squint at Washington, and glasses were prescribed, which he has used ever since with slight changes at times. Some five or six years ago the right eye began to diverge, and he had last year two operations performed, one at Washington and later one in Brooklyn, where he is now employed as a drug clerk. He was sent to me by one of his friends, but when I told him that the eye had to be operated upon in order to remove the defect, he became impatient, saying that three operations were enough for him. I gave him other glasses and advised him to think it over. He returned very soon, saying that everybody asked annoying questions about his eye, and if I could give him the assurance of a favorable success he would be willing to submit to an operation. As the case was really a very marked one, and as the former operations had not been successful, I decided to tenotomize both external recti freely, and to advance the capsule of tenon, conjunctiva and muscle, and after removing a fairly large elliptical piece of the capsule of tenon with conjunctiva, shorten the tenotomized internal rectus muscle by removing a piece of it near the divided tendon, and advance these parts as near to the cornea as possible.

The healing of the eye was quick and uneventful, and after two or three weeks he was able to resume his work with the eye in perfect position and very little thickening of the advanced portion. This thickening, as well as the redness, had entirely disappeared, and the action of the internal rectus of the right eye was now as perfect as possible. His headaches, which had been very annoying at times, had entirely disappeared, but he has never been able to discard his correcting glasses.

Case III. Mary Sch., 26 years of age, of New York City. Patient is a very attractive girl, with very large eyes, and on account of the prominence of her eyes the divergence of the left eye is very marked and is quite a deformity. The eye began to diverge many years ago, but she did not have the courage to have it attended to, but now she finds it hinders her very much in her business, and besides her eyes tire easily and she has a good deal of headache. Both eyes are slightly myopic. She accepts — 1.25 for the right, and — 1.75 for the left eye, and gets normal vision

with these glasses in each eye. However she has only monocular vision, and all efforts at convergence are of no avail to bring the left eye beyond the median line. The external rectus is quite weak but not enough to allow any divergence. The operation in this case consisted in a free tenotomy of both external recti, and the advancement of the capsule of tenon, after the removal of a small piece of the dissected internal rectus, and a fairly large elliptical piece of the capsule and the overlying conjunctiva. The result was very satisfactory, but there remained a small granulation mass at the nasal side of the eyeball, but this became eventually paler and smaller, and a few months after the operation had entirely disappeared. The position of the eye remained very good, and there is now binocular vision and the diplopia which existed for some months has now entirely disappeared. She is using her correcting lenses all the time, but I do not think that this makes much difference, and the eye is perfectly straight, even without glasses.

Case IV. Mrs. J. P., 33 years of age, of Bayonne, N. J. When a child six years of age she was operated upon by Dr. Agnew, who made a tenotomy of the left internal rectus for convergent squint. The result was quite satisfactory for several years, and glasses which were given to her for reading and near work were gradually abandoned. During the last years of her school life the left eye would occasionally diverge. Later this defect became more marked and permanent. Some five or six years ago she placed herself under the charge of Dr. Stevens, of New York City, who, according to her testimony, performed six or eight operations, first on one eye and then on both, trying advancement of the internal rectus after tenotomizing the external recti. When the lady presented herself at my office, upon the recommendation of Dr. Coleman, of this city, she complained about the deformity of her eyes, inability to use them for any fine work, and severe and almost constant headache. There was very marked divergence of both eyes and complete loss of the use of both internal recti and the conjunctiva, showing many scars and much redness of places where the operations had taken place. The lady could not look straight at an object, but had to turn her head correspondingly. Both eyes had nearly normal vision with the correcting glasses, but no diplopia, as she could not converge at all; in fact, she could not move either eye beyond the median line towards the nose, whether she used the eyes singly or made a combined effort. Up and downward movments were only slightly affected. In this case a most radical procedure was necessary, and I made a very free tenotomy

of both external recti and removed some of the muscle itself. I then proceeded to find the remnant of the internal recti, and I was fortunate to find both of them inserted almost at the posterior half of the eyeball. The anterior part of the capsule of tenon and the inner portion of the bulbar conjunctiva was stretched considerably and very thin. After securing the muscle I removed an elliptical piece of the capsule of tenon, as well as of the conjunctiva and a small piece of the muscle itself, and advanced the remaining part as far as possible toward the cornea, including the muscle in the suture, and fastened the parts by means of three double stitches. No suture was applied to the temporal wounds where the external recti had been cut. After washing the parts very thoroughly with a mild bichloride of mercury solution, I applied a drop of atropine to each eye, because I feared that the cornea might have been slightly injured during the operation, and applied a sponge-pressure bandage over the eyes. My reason for a sponge dressing to the eye was to prevent undue swelling of the conjunctiva and eyelids, and at the same time not to interfere with the nutrition of the parts, for I had left only a narrow portion of the upper and also of the lower part of the eyeball undisturbed. After removing the bandage for the first time, nearly forty-eight hours after the operation, I found both eyeballs in good position. I applied now an ordinary pressure bandage, which I kept on for five days longer, renewing it every day. I now replaced the bandage by a pair of dark coquilles. There had been no suppuration of the wound, and the stitches had remained in perfect position. There was a slight convergence of the left eye and a slight diplopia, and some thickening at the nasal side of each eye, but the wounds healed nicely and this thickening, which I just mentioned, became gradually less and less, and four weeks later there was only a slight redness remaining. The result of the operation was most satisfactory, and with a strong convex lens the slight convergence of the left eye became better and in a few weeks the movement of both eyes had become so perfect that it was almost incredible that the slender internal recti which I found at the time of the operation could now act in such a perfect manner. It is now eight months after the operation, and the lady is able to use her eyes for reading and sewing perfectly and without fatigue. She has no more headaches, and as long as she has the glasses on the position of the eyes is perfect, and only after removing the correcting lenses is there a very slight convergence, and even this seems to be improving constantly, and becomes less and less apparent.

This was one of the most aggravated cases I have ever seen. If one eye only is affected, the advancement of the divergent eye alone is sufficient, and only if the squint is very marked does it become necessary to tenotomize both external recti at the time of the operation. Usually the external rectus of the squinting eye alone has to be cut, but I believe in a very free division of this muscle and its attachments in order to give the advanced muscle an opportunity to form a firm union with the advanced capsule of tenon and the overlying conjunctiva. If such a union takes place and enough of the capsule of tenon and also of the muscle has been removed, it is not only impossible for the eye to diverge again, but the action of the advanced muscle becomes perfect, and there is hardly any defect in the movement of the eye to be seen.

INTERSTITIAL KERATITIS EXCITED BY TRAUMATISM.*

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In a perusal of the latest ophthalmic text-books, and the current literature on interstitial keratitis, it is rather a noticeable fact that while various etiological factors are discussed at length, either no mention at all, or only a passing mention, is made of the exciting factors which precipitate the attack, in the so-called typical forms of the disease. The reasons for this I am led to believe are the failure on the part of clinicians to record personal observations, and the fact that up to the present time experiments have failed to produce the typical form of the disease.

Most authors have accepted the opinions of Leber, and his followers, who regard the disease as invariably secondary to uveitis, and various experiments have been carried on by Samelsohn,[2] Raehlmann,[3], Leber,[1] Wagenmann[4] and Siegrist, Mellinger,[5] Berri,[6] Hippel,[7] and others, with the view of determining the particular pathogenesis of the disease; but of these experiments Parsons[8] says none of them can be regarded as affording typical examples of the

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clinical form of interstitial keratitis, the immediate cause of which is yet to be sought. Nuel[9] voices practically the same opinion as Parsons, though Holmes Spicer [10] thinks that the same series of experiments show that the disease begins primarily in the ciliary blood vessels.

The disease is, of course, but an expression of a cachectic state or dyscrasia of the general system, and the conditions which are known to be responsible for its existence are congenital syphilis (first recognized by Hutchinson), acquired syphilis (Hippel), tuberculosis (Michel), scrofulosis (Mackenzie, Fuchs), rheumatism (Leber, Parinaud, Brunner, Fornier, Knies and others), malaria (Arlt, Albrant, Berber, Bock, Knies, Mandelstamm, and Raynaud), influenza (Adler, Ehrlich, Greeff, and Pfluger), diabetes (Albrand, Cundemand, Michel), menstrual disorders (Davidson, Koenig, and Noblat), and leprosy (Greeff, Morax, and Trantes); but what occurrences or conditions may precipitate an attack of the disease in a patient, the subject of one of the above disorders, remains to be determined.

As previously stated, Leber and most other authorities, consider the disease to be invariably secondary to uveitis, but why every case of uveitis (and more particularly anterior uveitis) is not accompanied by interstitial keratitis, is yet to be explained.

That local injuries, irritations, or alterations in circulation may cause the localization of general conditions is an established clinical fact, and may be readily ascertained by referring to any standard medical or surgical work; and that trauma plays a particularly important part in this connection may be seen by the following quotations, which might easily be multiplied many times.

In an excellent article on tuberculosis in Gibson's *Practice of Medicine*, Hector Mackenzie[11] says an injury to a joint or lung may be followed by tubercle, and it would seem that as a result of the injury the part was less able to offer resistance to the tubercle bacillus.

In an article on syphilis, in the same work, Mr. Mackenzie[12] says injury to the tibia is connected with the frequency of nodes upon its crest, and the exposed position of the knee and its proneness to injury, especially in working women, explains the frequent localization of a gumma in the skin over it.

Lupus vulgaris may be determined by local injury, according to Sparks and Sangster.[13]

Local and frequently recurring irritations may determine the

development of cancer, in persons, at least, who are so predisposed, according to W. Allen Jamieson.[14]

If, then, an injury may cause the localization of general conditions in other parts of the body, why may it not also cause such localization in the eye and particularly in the cornea, a structure which, according to Leber, is entirely nourished by osmosis?

Fuchs,[15] Nuel[16] and others describe a form of parenchymatous keratitis of a circumscribed character (keratitis parenchymatosa circumscripta), which not infrequently develops after injuries, especially contusions, and it has also been observed by them in gout, malarial cachexia, influenza and syphilis.

Of this form of keratitis Schirmer[17] says: Disciform keratitis and keratitis post-variolosa are identical, and have nine points in common. These are: First, slight trauma as a cause, and second, central opaque disc in the deepest corneal parenchyma, surrounded by one or more complete or incomplete grey rings, with radial lines into the epithelium over the disk, which is of a stippled appearance. Third, of lowered sensibility. Fourth, clear cornea separates the disk from the limbus. Fifth, superficial ulcer is frequent. Sixth, the uvea is slightly involved. Seventh, the course is long (six weeks or more). Eighth, therapy is of little avail. Ninth, marked permanent leucoma results.

In so far as the pathological changes are concerned, circumscribed parenchymatous keratitis or disciform keratitis and the so-called typical or diffuse interstitial keratitis apparently differ only in degree, as the names would imply; for in both conditions there is deep infiltration, and varying degrees of vascularization.

A. Peters[18] (Rostock) explains the formation of keratitis disciformis by, first, œdema, which appears as a result of injury of the nerve endings in the cornea, the same as commonly occurs in injuries to nerve tissues in other parts of the body. This œdema, in turn, injures the endothelium of the posterior surface, and allows the aqueous to enter the cornea, thus intensifying the opacity.

After a thorough consideration of the above points, it seems that if circumscribed interstitial keratitis may be excited by traumatism, as is admitted by Fuchs,[15] Nuel,[16] Schirmer,[17] de Schweinitz,[19] and others, and if diffuse interstitial keratitis differs (pathologically) only in degree, why may it not also be excited by trauma? And it is the purpose of this paper to try and establish the fact that a trauma may excite a typical interstitial keratitis, in a patient having a latent dyscrasia which would predispose to such a condition.

This idea has been forced upon my mind by the following cases, which have come under my observation in the past few years:

M. D., a schoolgirl, aged 11 years, came May 2, 1901. She had never had any previous eye trouble. On the previous day, while returning from school, patient stopped to look through a window at some men working in a planing mill, when something was forcibly thrown against the window from within, shattering the glass and injuring her right eye.

There was considerable difficulty in obtaining a view of the cornea, and it was necessary to instill a solution of cocaine, in order to make a satisfactory examination, which revealed a large corneal abrasion at the upper margin, and a piece of hardened putty, 2 by 3 mm., was removed from the upper cul de sac. Atropine, cold applications, boric solution, and a bandage were ordered, and a good prognosis was given.

May 4th, the abrasion was smaller, but was surrounded by a small area of infiltration, and thinking I had to deal with a slight infection, I ordered a solution of atropine for home use, and changed from cold to hot applications.

May 7th, abrasion practically healed, but the area of infiltration in the cornea was larger, with no apparent tendency to ulceration —a fact which was rather puzzling. The flushes, atropine and hot applications were continued.

May 9th, the infiltration was extending rapidly inward toward the center of the cornea, and was distinctly deep in character; the corneal wound was entirely healed.

May 11th, the deep infiltration covered more than half the cornea, extending downward in a rather irregular triangle. A tentative diagnosis of interstitial keratitis was made, as the child presented undoubted evidence of inherited syphilis. There were scars at the angles of the mouth, cupping of the central incisors above, and partial deafness. She was also undersized, and had a loose, leathery appearance to the skin.

On May 16th, the cornea presented the typical ground-glass appearance of interstitial keratitis, with stippling of the epithelium, and the iris could scarcely be seen. From this time the case ran the usual course, and about six weeks later the left eye became involved.

The patient was kept upon inunctions, atropine and hot applications as long as the active inflammation lasted, and when all circumcorneal injection had subsided was put upon yellow oxide salve locally, and mixed treatment internally. She was discharged

in March, 1902, with R. V. $^{20}/_{80}$; L. V. $^{20}/_{60}$. Opacities and blood vessels could be seen in both cornæ with the ophthalmoscope.

Case 2. H. M., male, aged 22, a porter, came April 26, 1903. Has never previously had any disease or injury to the eyes. On the previous day was struck in the left eye with a rattan carpet beater, while he and a friend were at work cleaning a rug. Patient complained of severe pain and photophobia. Inspection revealed a rather deep cut in the upper outer quadrant of the cornea, but not penetrating the anterior chamber. There was considerable denuded epithelium, which stained readily with fluorescin. Atropine, boric solution and a bandage were applied, and when the case was seen, four days later, there was a distinct area of infiltration surrounding the abrasion, though the wound seemed to be healing. At the end of a week the cornea was well infiltrated in the upper outer quadrant, and the infiltration was of a deep character. By May 12th the case was a well developed interstitial keratitis, involving all of the cornea but a small area in the lower nasal portion. I never saw the case after the above date, which was eighteen days after the injury, but am satisfied that it was an interstitial inflammation, if for no other reason, from the fact that there was a well-marked deep vascularity of the cornea.

This patient was, so far as I could determine, in perfect health; he knew very little of his family history, and had never suffered from any serious illness.

Case 3. D. T., male, carpenter, aged 23. Patient came first on October 20, 1903. He was suffering with a severe attack of interstitial keratitis in the left eye, of three weeks' duration, and there was a large salmon patch in the upper temporal quadrant. Vision shadows. Patient was a small man; had never been strong; had distinct evidence of hereditary lues, viz., Hutchinson's teeth, cervical adenitis, complete alopecia, and marked serous effusions in both knee joints.

Atropine, hot applications and inunctions were ordered and continued until January 5th following, when, the active inflammation having subsided, the treatment was changed to yellow oxide ointment locally, and mixed treatment internally. Vision $= {}^{13}/_{200}$. Patient returned to his work.

April 4th. He returned, on account of an injury to his right eye, which occurred three days previously. While driving a nail, the head had broken off and struck him in the eye.

Examination revealed a large ulcer near the center of the cornea,

the ulcer bed was covered with necrotic tissue, and was surrounded by a distinct area of infiltration.

The ulcer was cauterized with 95 per cent phenol, atropine instilled, and a pressure bandage applied. Ten days later the ulcer had healed, but the infiltration had extended to a considerable extent, and with the loupe blood vessels could be seen entering this area of infiltration from the corneal margin. Later the disease process gradually extended and became more intense, until the iris was entirely hidden from view.

The case was watched for about ten weeks, the clearing process having begun when the patient was lost sight of. Mercurial inunctions, atropine and hot fomentations was the treatment adopted throughout the second as well as the first attack.

Case 4. Furnished through the kindness of Dr. J. B. Loring, of Chicago. Miss O. M., aged 32, was first seen January 5, 1901, on account of a burn of the left cornea, sustained four hours previously with a curling iron. The conjunctiva was injected, and there was much pain. V. $^{6}/_{9}$. Atropin, sterile vaseline, and a bandage, were applied. January 8th, a slight ciliary blush was present, and there was a slight cloud in the cornea around the injured spot. On the 16th, there was considerable infiltration of the cornea, most marked at the sight of the burn, with marked ciliary injection. In another two weeks the greater portion of the cornea was infiltrated, and vessels could be seen extending deep into its substance; the epithelium was intact. In April there was still a slight cloudiness of the cornea. Vision was $^{6}/_{12}$. In February, 1905, the patient was found to have $^{6}/_{8}$ vision, with correcting lens, and small nebule and the remains of blood vessels could be seen in the cornea. The patient was a subject of inherited lues.

In addition to the above cases, I have collected the following similar cases from the literature, some of which I am unable to supply in detail on account of the inaccessibility of the literature. They include, however, all that have so far been published.

Brenski[20] reports a case of parenchymatous keratitis following injury, in an inaugural dissertation at Giessen, in 1881.

Anke[21] reported a case of keratitis parenchymatose from Hirschberg's clinic, which followed the splashing of acid into the eye.

Brunner[22] contributes two cases of parenchymatous keratitis, which followed trauma of the eye in luetic individuals, viz.: (1) A fourteen-year-old girl, with characteristic history and symptoms of hereditary lues, and who up to this time had never had eye disease, was seized with the specific form of corneal disease, five days

after being struck on the eye by the handle of a small mill, and in whom five months later the same affection appeared in the other eye. A cure was affected by mercurial inunctions and potassium iodide. (2) Was the case of a man, 21 years of age, with typical hereditary syphilitic physiognomy, who had never suffered of eye disease until four days after an injury to his left eye by a fragment of coal. Thereupon a parenchymatous keratitis followed, which soon advanced to the second eye. The case was only relieved after eight months of inunction treatment, and with preservation of only one-half vision.

Szapoda[23] contributes the case of a girl of six years of age, a subject of hereditary syphilis, and who had heretofore had no eye trouble, in whom a parenchymatous keratitis followed a wound of the left cornea. The right eye was later attacked by the disease.

Valude[24] reports a case of syphilis hereditaria with parenchymatous keratitis following traumatism.

Breuer[25] noted a case of parenchymatous keratitis, in the Giessen University Eye Clinic, which followed immediately after a trauma.

Armaignac[26] reports a case of this character in a mechanic of thirty-four years of age.

Noyes[27] reports a case of parenchymatous keratitis in an infant, the condition following an injury caused by forceps delivery. There was no evidence of hereditary syphilis in this case, and the condition was limited to one eye.

Morinani[28] reports the case of a girl, twenty-one years of age, who had never previously suffered from eye or other disease, in whom the left eye showed a typical parenchymatous keratitis following an injury by a plum which struck the eye and caused inflammatory reaction, and on the ground of the healing obtained by tuberculin the tubercular nature of the disease was inferred.

Bietti[29] reports two cases from the Freiburg University Eye Clinic. The first, a farmer, forty years of age, suffered an injury to his left eye through a small pebble, and eight days later developed an atypical parenchymatous keratitis.

The second, a peasant girl of twenty years, developed a typical parenchymatous keratitis directly after a trauma of the left cornea from a splinter of wood.

Work Dodd[30] reports three cases, all showing undoubted evidence of congenital syphilis. The one suffered a superficial injury to the right cornea by a piece of metal, and directly following developed a characteristic parenchymatous keratitis, the left eye becoming involved later.

The second was the result of a superficial injury to the cornea caused by a mosquito bite, which later developed a typical interstitial keratitis. The second eye became involved, and the case ran the typical course.

The third case began after a blow on the eye by a football. Here there was no apparent corneal wound, but the injured eye developed interstitial keratitis and subsequently the other eye did likewise.

Hummelschein[31] reports the case of a boy, ten years old, in whom a parenchymatous keratitis followed directly upon a blow to the right eye, and attacked the left eye three months later.

Perlia[32] (Krefelt) reports the case of a wire worker of sixteen years who was struck in the right cornea by a fragment of brass, which was removed by one of his co-workers. The eye did not become quiet, but developed a typical parenchymatous keratitis. The patient was poorly nourished, but there was some difference of opinion among the consultants as to whether the general condition was one of inherited lues or tuberculosis. The patient subsequently developed the disease in the other eye.

Limbourg[33] reports one case in a luetic subject, in which a typical interstitial keratitis followed an injury to the eye.

Pflang[34] reports the case of a girl of twenty who suffered from serous iritis in both eyes. A paracentesis of the cornea was done on the left eye on account of increased tension, and was directly followed by a parenchymatous keratitis, which was typical. The patient was a scrofulous subject.

In my own cases, and in all of the cases which I have listed, the type of the keratitis was diffuse, with one exception (one of the cases reported by Bietti), and I am convinced that at least one of the exciting causes of the ordinary form (*i. e.*, diffuse interstitial keratitis) is trauma, and that there are other exciting causes, I have no doubt.

It has occurred to me while studying this subject that possibly the reason for the irregularity in the interval between the attacks in the two eyes is due to the absence of an exciting cause in the unaffected eye, when the other one is attacked.

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31. Rhine and Westphalia, Oph. G., Trans. (Discuss. on Jequirity), 1904.
32. Offic. Rep. Rhine and Westphalia Oph. G., Monbl. d. Aug., March, 1905.
33. Offic. Rep. Rhine and Westphalia Oph. G., Monbl. d. Aug., March, 1905.
34. Offic. Rep. Rhine and Westphalia Oph. G., Monbl. d. Aug., March, 1905.

BACTERIOLOGY OF A CASE OF DENDRITIC KERATITIS.*

BY GEORGE F. KEIPER, A. M., M. D.,

LAFAYETTE, IND.

Ear and Eye Surgeon to St. Elizabeth's Hospital, St. Joseph Orphan Asylum, Tippecanoe County Children's Home, Indiana State Soldiers' Home, Pension Bureau, Etc., Etc.

AND

FRANK R. SPENCER, A. B., M. D.,

BOULDER, COLO.

On September 14th, 1904, Joseph B., age 19, presented himself with a sore right eye.

Examination showed the cornea involved with a dendritic keratitis, as depicted in Fig. 1.

The usual symptoms of iritis with neuralgic pains and ocular inflammation in general were present. There was no purulent discharge. The patient's family history is bad. We were told that gonorrhea was common in the family. There is no history of malaria.

The patient's physical condition was poor, from probably lack of good food under bad hygienic surroundings. He was put into the St. Elizabeth Hospital under strict treatment.

Upon his admission cultures were made from the ulcer and the conjunctival sac. Only Loeffler's blood serum was available and it was used. Fig. 2 shows the character of the growth made three days after the inoculation of the test tubes. The growths from the cornea and conjunctival sac are alike. The colonies are somewhat depressed.

On September 20th the colonies on the culture medium are still more depressed than when the drawings were made.

On September 22nd the colonies have become confluent and are markedly depressed.

On September 23rd the corneæ of a rabbit were inoculated subjunctivally with the growth. There was no reaction. The inoculation was repeated the 25th and the 27th, and negative results were obtained.

Slides made from these cultures and stained with the standard aniline dyes, showed what appeared to be a diplococcus, apparently

* Read at the tenth annual meeting of the American Academy of Ophthalmology and Oto-Laryngology, Buffalo, Sept. 14th to 16th, 1905.

the diplococcus of Neisser. But we had no gonorrheal discharge from the eye, and, in fact, the eye had never manifested any purulent discharge at all. Hence, a question of doubt immediately arose. Gram's method was used and the bacteria were negative, as is the gonococcus.

Our next effort was to differentiate it from other bacteria, but we could find no known description which answered in all respects the growth which we had obtained.

The cultures were submitted to Professor Severance Burrage of the Department of Biology of Purdue University, but after due searching and staining and cultivating, reported that he could find no bacterium which corresponded with the growth submitted to him. He further sent cultures to Indianapolis and Chicago, but nothing could be learned which would throw light upon the subject in hand.

After consultation with Professor Burrage, a culture was sent Professor Frederick G. Novy, of the University of Michigan. He turned it over to his assistant, Dr. David G. Levy, who, under date of May 19th, of this year, made the following very complete report:

Ann Arbor, Mich, May 19th, 1905.

Dr. George F. Keiper, Lafayette, Ind.

Dear Sir: After an investigation of the properties of the organism received from you, I have been unable to identify it with previously described bacteria. However, it appears to be related to the group of diplo-bacilli associated with affections of the eyes. Briefly, its properties are as follows:

Form: A short thick bacillus with broad ends rounded and often irregularly squared. There is a tendency to arrangement in pairs. The germ varies in size and involution forms are common.

Motility: Apparently absent. Brownian movement marked.

Sporulation: None observed.

Aniline Dyes: Stains fairly well. Bipolar staining frequently observed. Gram, negative.

Growth: Moderately rapid in incubator. Agar plates, small, spherical, glistening colonies and of a bluish tinge.

Gelatine Stub: Growth along the entire line of inoculation. Surface growth flat and slightly spreading. No liquefaction.

Streak Cultures: Agar bluish white, glistening spherical colonies which coalesce and form a rather thick surface growth.

Loeffler's Blood Serum: Rather thick greyish white growth. Potato growth slight and invisible.

Bouillon: Growth scant. Medium becomes slightly cloudy.

Litmus: Colored mannite, maltose, glucose, dextrin and levulose beef tea became acidified. The alkalinity does not return. Lactose and saccharose beef tea show a slight temporary reduction of the litmus. Gas is not produced in any of these media.

Milk: Slight acidification has been observed. No coagulation.

Pathogenesis: Guinea pigs suffered no ill effects on intraperitoneal injections of large quantities.

There is a germ described by Zur Nedden, to which this germ may be closely related. I have not had access to Zur Nedden's

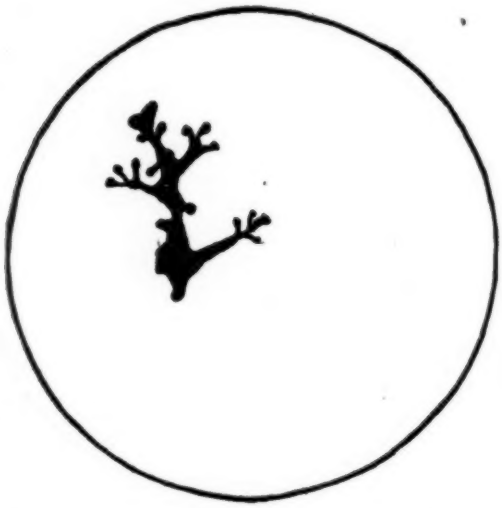


FIGURE 1. Joe Belden. Dendritic Keratitis of Right Eye. September 4, 1904.

original article (*Klin, Monats. bl. f. Augenheilk.*, January, 1902). The organism is described in Koll and Wasserman's Handbook der Pathogen. Mikro-organismen, Vol. III, p. 574. This germ differs from the one which you have isolated, in that it coagulates milk, forms a thick yellowish-brown growth on potato and its gelatine stab characteristic is a flat nail head, limited to the upper part of the stab.

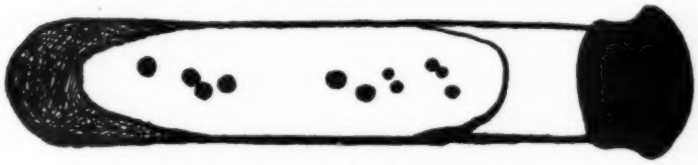
I would be very much interested in knowing the appearance of your germ in stains of the fresh material from which it was derived. With best regards, I remain,

Very truly yours,

DAVID G. LEVY.

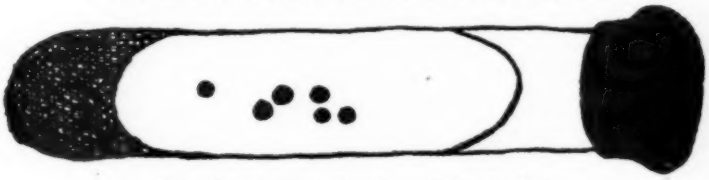
Our textbooks are rather brief upon the pathology of dendritic keratitis. Hence this is submitted, that others seeing like cases may be induced to proceed as above, for possibly dendritic keratitis may have its etiology lodged in what appears to be a new germ. Dendritic keratitis is very infrequently seen by me. The treatment

Cultures on Loeffler's Blood Serum taken from Conjunctival Sac.



Colonies are round, flat, depressed and white.

Colonies on Loeffler's Blood Serum taken from corner of R. E.



Colonies are round, flat, depressed and white.

FIGURE 2.

consists in the application to the ulcer once daily of absolute alcohol. Atropia in a 1 per cent solution was also instilled and the ulcer frequently irrigated with warm normal saline solution applied in a fine stream directly to the ulcer surface.

He recovered in four weeks with a scar marking the spot of the former ulcer. Internally he received the fresh syrup of the iodide of iron.

DISCUSSION ON

REPORT OF A CASE OF ELECTRIC OPHTHALMIA.*

BY EDWARD B. HECKEL, M. D.

PITTSBURG.

Dr. Ball (Warren, Pa.): I would ask what treatment, if any, was used for the intense pain caused by the exposure. Yesterday morning, before coming here, one of the Westinghouse employes in our town was subject to a sudden exposure of 3,300 volts, and had intense hyperæmia of the conjunctiva, and very severe pain.

Dr. Ringueberg (Lockport, N. Y.): I had three cases after the last time we had a solar eclipse, in one of which there was at the macula a crescentic yellowish raised spot the shape of the visible portion of the disc, and corresponded to its appearance at about the time he looked at the eclipse; he permanently lost a little central vision.

Dr. Willetts (Pittsburg): I recall a gentleman, who, while heating a wire for his boy, over a gas flame, complained of a central scotoma of limited area. Ophthalmoscopic examination revealed no pathologic condition of the retinæ, and I told him that in all probability the retina would resume its function. At the end of three months the scotoma was still present, and later there was a pronounced central œdema. He went to New York and the case was diagnosed a possible albuminuric retinitis, and he was recommended to go to California, which he did, remaining about a year. That was all of ten years ago. The patient has completely recovered, excepting a slight vertical distortion of lines, and is at present engaged in active business pursuits.

Dr. Wood: Was the form of scotoma observed colored or white?

Dr. Willetts: If I remember correctly, it was white or yellowish.

Dr. Vail (Cincinnati): Some two years ago, a friend and fellow ophthalmologist desired to test the relative merits of two electric ophthalmoscopes, and I offered my eye for his test. He placed me in a dark room and subjected the eye to a long test with the two instruments, with a view of purchasing whichever he liked best. After the test was over and I returned to my office, everything

*See page 29.

looked absolutely purple to that eye. The color of my office was royal purple. The deep blue color was uniform over the entire field; objects with the other eye appeared normal. This condition persisted for an hour and a half, gradually becoming lighter in shade, until it was but a slight lavender color. The next day I could still detect a slight difference in the color of the whiteness of the card, as seen with my eyes single. The practical application to this, in my mind, has been, that if the eye, which was in a normal and healthy condition, could be given such a profound impression from the glare of an electric ophthalmoscope, what would be the effect of subjecting an eye affected with some form of deep-seated inflammation, like albuminuric retinitis, to the glare of an ophthalmoscope for an equal time? We are not fully conscious of the amount of glare an eye is subjected to in these cases. Our interest in the case causes us to lose sight of the harm which might be done with the ophthalmoscope. We should make our examinations as expeditiously as possible. The more expert you are, the more you can see in a short period. I know of some ophthalmoscopists who boast of spending hours in making an accurate drawing of the fundus. I am satisfied that positive harm may result from a protracted ophthalmoscopic examination.

Dr. Blackham (Dunkirk, N. Y.): I came here as a student, but I would like to refer to a personal experience. A great many years ago, when I was a good deal younger than I am now, there was to be a transit of Venus, and I was assisting the professor in charge of the Highschool to observe it with the school telescope; I was to do the examining to get the contact, and he was to take the time. When we got all ready, he had left the dark glass of the telescope at home, and I undertook to make these observations by putting on a couple of pair of smoked glasses, and I had much the same experience. That night I went down town, and it was about the time of the blue glass enthusiasm, and I thought the idea had surely struck town, for it seemed to me the stores were all illuminated with blue glass. This condition persisted for more than four weeks. I do not know that it injured my vision in any way, for the only pathological condition I was aware of was this blue vision, and it was confined to the right eye, the one with which I looked at the sun through the telescope. With regard to the paper, while it seems to me that the blistering of the skin was a simple case of burn, the scotoma was the direct result of the action of the light on the retina. I am curious to know, except as a placebo, what the strychnia has to do with the restoration.

Dr. Heckel (closing): I would say, in reply to Dr. Ball, that cold compresses and cocaine are the things to relieve the pain. The scotoma was positive, simply a blank spot, and from what he told me—I did not see him in the acute stage—I imagine it must have been about 30 or 45 degrees. When I saw him it was practically circular, and in looking at the $^{20}/_{20}$ line, as he moved his eye along the line it was just large enough to include one of these letters. My chief object in reporting this case was to elicit some discussion on the probable changes which may have taken place in these retinæ. We know quite a little about the act of vision; for instance, we know that the rods and cones are the light-perceiving stratum of the retina. We also know that the rods are directly concerned with visual purple, and we further know that there are no rods in the macula lutea. I think we know enough, however, to say that vision depends upon certain chemical changes, and that it is impossible to exhaust these and produce a partial or complete blindness. There may have been some changes in the anterior layers which prevented the light from passing through to the light-perceiving stratum of rods and cones. I believe it to be an exhaustion of those chemical elements necessary for vision. I do not believe the strychnia had anything to do with the restoration of vision, as I stated it was given on "general principles," but chiefly to keep track of the patient. I think this perfectly legitimate as long as it is for the benefit of the patient.

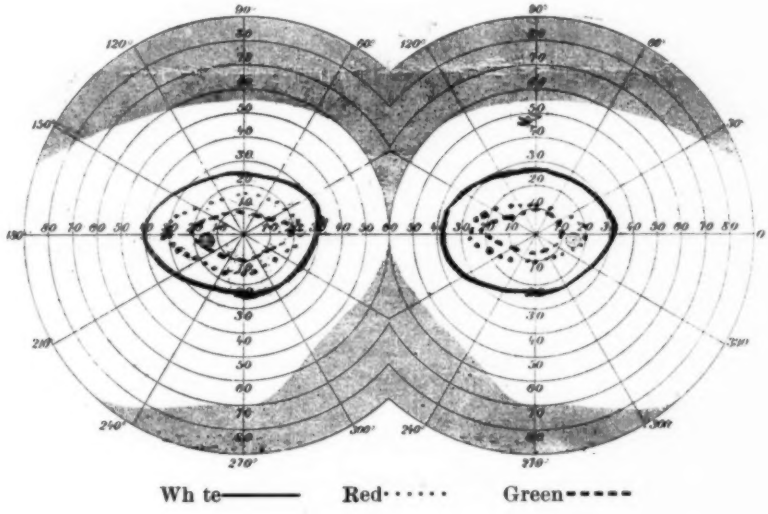
REPORT OF A CASE OF QUINNINE AMAUROSIS.

By L. R. CULBERTSON, M. D.,

ZANESVILLE, OHIO.

Mrs. A. D. K., aged twenty-five, residing in a small town. Was called in consultation with the family physician October 14th, 1904, at her home. Her physician gave the following history: Two weeks before she had been confined (primipara). She had never complained of her vision before or during confinement. Labor normal; shortly after puerperal peritonitis developed, and very large doses of morphine were given for this, and at the same time ten grain doses of quinine were given every four hours. This did not control the fever, and another physician was called in counsel, who advised giving sixty grains within twenty-four hours. Three twenty grain doses were given by mouth within sixteen hours, when

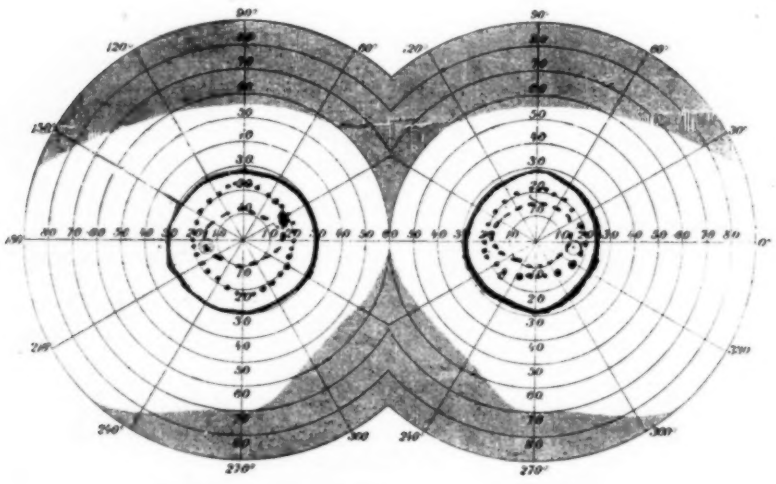
the temperature, which had been 106° F., fell to normal, and she went to sleep and slept all night. Next morning she awoke and said she was totally blind, and almost totally deaf. Hearing improved rapidly in a few days, and in two weeks was almost normal. Urine at the time of onset of puerperal fever 1,008 and small amount of albumen. Two weeks after, when the writer saw her urine s. g. 1,008, slightly cloudy by heat and nitric acid, no tube casts, excess of urates and uric acid. Examination—Sight has improved so she can see objects and people, but there is a haze before her. Can see finger in all parts of the field with each eye. Tn. each. R. E. pupil widely dilated (no atropine in it) and does not respond to light, either direct or consensual. Media, normal. Retinal vessels distinct, but look too pale. Retina is not pink, but



rather grayish in color. Arteries on disc and macular region slightly diminished in calibre, but the veins are much diminished in size. Near the disc there is a constriction in the central vein; this occurs at another place in one of the branches. Disc slightly hazy and quite pale, and shows very slight cupping. Peripheral arteries and veins very fine. Left eye ground about the same as the right. Could not tell any colors. One month later an examination was made at my office and V. Rem. with + .50 cy 90 = $^{5}/_{8}$ and L. E. + .50 cy 90 = $^{5}/_{6}$. Ophthalmoscopic examination—R.

E. Disc pale but not cupped. Retina pale, grayish tinge, veins and arteries good sized, but veins show whitish spots along their course. L. E. same condition as right. Visual field see charts.

Treatment—I prescribed the treatment first recommended by me for optic atrophy in 1896. (See *American Jour. of Oph.*) *i. e.*, the combined use of nitro-glycerine internally and strychnine hypodermatically; also citrate of potash. November 16th, the same treatment, sweat baths and large doses of Burnham's soluble iodine and Wayne's diuretic. January 13th, 1905, V.R.E. = $^5/_5$, L.E. = $^5/_5$ Oph. Ex. Arteries are smaller than normal; veins show whitish streak along their course. Disc, no cupping, and very pale. Retina pale and grayish color. V. Fields, see chart. Can tell color very much better. Continue strychnine and nitro-glycerine.



White——— Red····· Green-----

J. H. Claiborne, in *New York Medical Journal*, 1894, states the number of cases reported to date are fifty-eight. He also states: "The symptoms of quinine amaurosis are blindness, total or incomplete, which usually comes on suddenly; a dead, pearl-like pallor of the optic nerve, strikingly simulating the pallor of atrophy, accompanied by greatly contracted retinal vessels, both arteries and veins with occasionally total disappearance of an artery or vein; concentric or elliptical contraction of the field of vision. The color sense usually returns entirely."

De Schweinitz (*American Ophthalmological Society*, 1891) made some very interesting experiments of injecting quinine hypodermatically in dogs and making ophthalmoscopic examination

and microscopic examination of their eyes. The latter examination showed that "toxic doses of quinine could produce thrombosis of the central vein, and that neither neuritis or atrophy, in the true sense of the word, was present in the animal longest blind (nearly a month), but there appeared to be a species of œdema between the optic nerve and chiasm." De Schweinitz's experiments were very exhaustive and interesting.

Ward A. Holden (*Transactions American Ophthalmological Society*) says: "A number of dogs were killed at periods ranging from two hours to seven weeks after the first injection of quinine, and the eyes, optic nerves, brains and cords were examined by the Nissl-methylene blue method for cell changes and Marchi-osmic-acid methods for nerve fibre changes. Retinæ examined on the third day, after several toxic doses had been given, revealed degenerative changes in a few ganglion cells (vacuolation, paleness, and absence of chromophilic granules and breaking down of the cell body); and changes in the nerve fibres (a deposition in the nerve fibre layer of large globules of a myelene character). These degenerative changes gradually increased; and by the forty-seventh day the ganglion layer and the nerve fibre layer had almost disappeared. The changes in the optic nerve were first observed on the seventeenth day, consisting in a breaking down of the medular sheaths of the fibres, and this degeneration of the nerve could be traced up to its fibres in the external geniculate body and pulvinar. With the lessened, but not obliterated blood supply, due to the spasm of the vessels in quinine poisoning, the less resistant elements of the inner layers—the ganglion cells and the nerve fibres—break down while the cells of the inner nuclear layer are not visibly affected. An ascending degeneration of the nerve fibres follows the retinal change." (See also Norris' and Oliver's System) article by De Schweinitz Toxic Amblyopias) De Schweinitz (Norris' and Oliver's System) also says:

"The gaps in our knowledge of the pathogenesis of experimental quinine—amblyopia have now been filled, with one exception, namely, the cause of primary contraction of the retinal vessels, which creates the ischæmia and which the writer and other authors have attributed to the effect of a highly cinchonized blood upon these vessels, an explanation, however, which is not entirely satisfactory. Authorities recommend for treatment in these cases nitrite of amyl and strychnine (De Schweinitz); galvanism (Buller); hydrobromic acid (L. W. Fox); iodide of potassium (Calderai).

MEDICAL SOCIETIES.

PRELIMINARY PROGRAM OF THE ELEVENTH MEETING OF THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

To be held at Detroit on August 30, 31 and September 1, 1906.

OPHTHALMIC SECTION.

Wm. M. Mittendorf, New York, N. Y.—Punctate Opacities of the Posterior Lens Capsule.

Alvin A. Hubbell, Buffalo, N. Y.—Spontaneous Dislocation of Both Crystalline Lenses in Two Members of the Same Family.

Lucien Howe, Buffalo, N. Y.—Note on How to Obtain Reliable Replies by Letter from Patients.

Walter R. Parker, Detroit, Mich.—Exclusion of Hypermetropes from Railroad Service.

T. .A Woodruff, Chicago, Ill.—Irrigation of the Anterior Chamber in Cataract Extraction.

John F. Byington, Battle Creek, Mich.—Melano Sarcoma of the Chorioid, with Report of Case Operated on Before the Glaucomatous Stage.

O. B. Monosmith, Lorain, O.—A New Method of Enucleating the Eyeball.

Homer E. Smith, Norwich, N. Y.—Cataract Extraction with Preliminary Capsulotomy.

Eugene Richard Lewis, Dubuque, Ia.—Suggestions for Americans Contemplating Post-Graduate Ophthalmologic Study in Europe.

George F. Keiper, Lafayette, Ind.—Occlusion of Branch of Central Artery of Retina.

Randolph Brunson, Hot Springs, Ark.—Syphilitic Disease of Optic Nerve.

D. Emmett Welsh, Grand Rapids, Mich.—Embolism of the Central Artery of the Retina. Report of Case.

Wm. Evans Bruner, Cleveland, O.—Acute Retro-Bulbar Neuritis.

L. Webster Fox, Philadelphia, Pa.—The Value of High Frequency Current in Ophthalmic Practice.

L. W. Dean, Iowa City, Ia.—

James Moores Ball, St. Louis, Mo.—The First American Ophthalmic Text-Book.—The Work of George Frick, of Baltimore.

Wm. M. Sweet, Philadelphia, Pa.—Comparative Studies of the Visual Fields, as Determined with Electric and Reflected Light Exhibition of Improved Electric Light Perimeter.

Howard J. Hansell, Philadelphia, Pa.—The Treatment of Myopia.

Lee Masten Francis, Buffalo, N. Y.—Treatment of Acute Dacryocystitis.

T. W. Moore, Huntington, W. Va.—Changes in Curvature of Cornea Produced by Chalazions.

H. V. Wuerdemann, Milwaukee, Wis.—Massage and Electricin Treatment of Atrophy of the Optic Nerve and Retina.

Albert Rufus Baker, Cleveland, O.—A Statistical Inquiry as to the Relief and Cure of Migraine by the Correction of Errors of Refraction.

George M. Case, Elmira, N. Y.—Eye Strain and Crime.

R. Marcus Gunn, London, England—Oration on Ophthalmology: "Ailments of the Optic Nerve."

Dr. Casey A. Wood, Chicago, Ill.—Address on Ophthalmology.

A. Alt, St. Louis, Mo.—Note on Coloid Bodies and their Influence on Ossification of the Choroid.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

PRIESTLY SMITH, F.R.C.S., President, in the Chair.

Thursday, November 9th, 1905.

PHLYCTENULÆ.

Dr. L. B. NIAS and Mr. LESLIE PATON read a preliminary note on the value of the opsonic index for tubercle in phlyctenulæ. The research was suggested by Dr. Wright, who had observed that a crop of phlyctenulæ frequently developed in patients undergoing inoculations with tuberculin. This suggested the investigation of the opsonic index in such cases in the hope that it might throw some light on the question of the tuberculous nature of the disease, and show whether it was exogenous or endogenous in origin. The opsonic index was determined by Dr. Nias in 20 cases of the disease, 5 patients with other forms of conjunctivitis being used as controls and 7 of the 25 cases being simultaneously examined so as to determine their opsonic index for staphylococcus. The results showed in striking form variations from the normal in the tuberculous index of the cases of phlyctenular conjunctivitis, practically normal indices for the other forms, and practically normal indices for staphyloccus in the majority of cases tested. In one case in which there was fairly advanced phthisis, both the tubercle and also the staphylococcus indices were lowered.

ALBINISM.

Mr. NETTLESHIP, in a note on some varieties of albinism in man, mentioned the following: (1) Albinism of hair and skin with normal eyes; (2) albinism of eyes with hair that, originally white, became yellow or red or quite brown about the age of puberty; (3) albinism of choroid only, with nystagmus and defective sight; (4) progressive pigmentation of the albinotic eye, as in Class 2, but occurring too long after birth to allow of any improvement of sight; (5) pied albinism—that is, congenital absence of pigment from certain areas of the skin. In incomplete human albinism the whole uveal tract was entirely free from pigment, while the retinal epithelium was more or less pigmented. Manz proved this

in 1878, and Usher had confirmed this in some sections from the eyes of two individuals. In sections of the iris of a completely albinotic man the author had found the posterior epithelium, as well as the iris itself, devoid of any trace of pigment.

COLOR BLINDNESS.

In discussing the question of color blindness in women, Mr. NETTLESHIP mentioned five families in which one or more females were congenitally color blind; in four of them some of the males were also affected, and in one the family history was not obtained. He pleaded for a systematic search for color blindness in females, especially in families affected by it, so that the current opinion as to the ratio being 1 female to 40 males affected, might be tested; it could also be ascertained whether the disease passed from an affected father, through an unaffected daughter, to a grandson, as in hæmophilia. Slight degrees of color blindness, especially if intentionally concealed, would be more difficult of detection in women than in men.

METASTATIC SARCOMA OF THE RETINA.

Dr. ARTHUR J. BALLANTYNE gave a lantern demonstration of a case of metastatic sarcoma of the optic nerve and retina. The patient was a woman aged 58, with a right-sided hemiplegia, paresis of the left internal rectus, and blindness of the left eye. All these symptoms were said to have come on within one week. A yellowish oval mass projected from the disc and completely concealed it; its diameter was about three times that of the disc; in the retina there were numerous flame-shaped hæmorrhages. At the necropsy, patches of softening in the pons and corpus siraitum were found, and a sarcomatous mass in the mediastinum and root of the left lung. Metastatic growths were found distributed almost all over the body; that in the optic nerve had pushed its way through the lamina cribrosa into the eyeball, and was thus seen ophthalmoscopically. The greater part was necrotic, but parts stained well. The author ascribed the metastasis to embroli reaching the blood stream through the walls of the pulmonary vein.—*British Medical Journal.*

CHARLES J. OLDHAM, F.R.C.S., Vice-President, in the Chair.

Thursday, December 14th, 1905.

LIGHT SENSE IN STRABISMUS.

Dr. D. Matheson Mackay read a paper on the light sense in strabismus, based on an examination of 1,245 cases of strabismus or amblyopic patients. No corresponding observations had been published, and his own investigations had been undertaken in order to discover if there were any defect in the light minimum, or the light difference, of the affected eye which could account for the strabismus or the amblyopia. The photometer employed was a new one, and was described as having several advantages over those previously used. The cases were arranged in six groups—convergent strabismus with amblyopia (66 cases), convergent strabismus without amblyopia (30 cases), alternate convergent strabismus with double amblyopia (2 cases), divergent strabismus with amblyopia (9 cases), divergent strabismus without amblyopia (4 cases), and amblyopia without strabismus (14 cases). In all these cases both the light minimum and the light difference were estimated separately, and the results in the more important groups showed that a large majority of the affected eyes had normal light sense (77 to 90 per cent. as to the light minimum, and 75 to 80 per cent. as to the light difference). The lesser groups had the same tendency, but on account of the small number of cases their results were not insisted upon. His general conclusion was that the condition of the light sense was not responsible for the squint or for the amblyopia.

CYCLOPS.

Mr. Stephen Mayou read a paper on cyclops. The specimens, four in number, were obtained at the London Hospital through the kindness of Dr. Keith.

Case I was that of cyclops in a dog. It showed a single centrally-placed eye, having only one elongated lens, and a single retina. The optic nerve consisted of two layers of cells.

Case II was a human cyclops, having two lenses, corneae and retinae, with a single optic nerve. This specimen was peculiar in having no proboscis or olfactory nerve.

Case III was a human cyclops with extreme michrophthalmos. It had two lenses and corneae, and there was a partial inclusion of the proboscis between the anterior parts of the globes. The posterior halves of the ventricles were converted into a large cyst (local dydrocephalus).

Case IV was a twin cyclops, with complete union of heads, and fusion between the eyes of either fetus; the fusion was so perfect that no differentiation could be made out except a small coloboma of the nerve sheath.

Full anatomical details of the results of the maldevelopment of the first cerebral vesicle, together with the microscopic anatomy of the eyes, were given.

Retro-Ocular Tumor.

Mr. Richardson Cross gave a description of 7 cases he had operated upon for retro-ocular tumor; 5 of them were treated by Kronlein's method. He described the various conditions in which an exploratory operation such as this would be of the greatest benefit; it assisted the diagnosis, and left the patient no worse for its performance. The operation was briefly explained.

Case I was a fibro-adenoma of the lachrymal gland, but it left behind ptosis and partial paralysis of the ocular muscles with inversion of the eyeball; an unsatisfactory result. Case II was a hydatid cyst removed from the optic nerve. This was removed with a good result. Case III was a fibro-fatty tumor of the eyeball, which passed backwards into the orbit. It was removed successfully. Case IV was a sarcoma of the upper lid, which caused proptosis. The eyeball had to be removed with the tumor, as it happened, although there seemed a reasonable probability that the eye might be saved before the operation was undertaken. The patient made a good recovery. Case V was a similar growth under the upper lid, in which the orbit was eviscerated without any attempt having been made to save the eye. Case VI was a large growth at the inner and lower part of the orbit, which was removed by an incision along the inner and lower walls of the orbit. Case VII was one of severe proplosis, with retro-ocular growth treated by Kronlein's method. A sarcomatous mass had destroyed the upper wall of the orbit, and was in contact with the brain. The antrum was also involved. The wound healed up and left good vision, and good use of the eyeball; even the internal rectus was not damaged.

Mr. Cross also showed another case in which he considered an exploratory operation desirable. He was greatly impressed with the utility of the operation, and urged that it should be done in any case in which there was doubt as to the nature of the condition of the orbit.

PRIESTLY SMITH, F.R.C.S., President, in the Chair.

Thursday, January 25th, 1906.

SEPTIC THROMBOSIS OF CAVERNOUS SINUS.

Mr. Simeon Snell (Sheffield) related the following case:

On May 1st, 1895, a medical man pricked a small vesicle on the upper lip with a gold scarf-pin which had been used previously to open an abscess, and which was thought to be clean. The next day there was redness and swelling, and later on that day he was obliged to go to bed. On the 5th the condition of the lip was worse, and the blush extended to the left cheek and orbit. This was followed by proptosis and swelling of the conjunctiva and eyelids. Later the right side followed the same course, the proptosis being even more marked than on the other side. The movements of the eyeballs were interfered with, and there was paralysis of the right facial nerve and deafness on the right side, also dullness and evident effusion of the right side of the chest. The patient died fourteen days after the commencement of the illness, his mind having been unaffected throughout.

Mr. Snell remarked that the initial lesion was that on the lip, which the medical attendants had considered to be malignant facial carbuncle. No *post-mortem* examination was allowed.

ACUTE OEDEMA OF EYELIDS.

Mr. Snell also related this case.

A pork butcher, aged 48, came to him with acute oedema of the eyelids on both sides. The day before he had been dressing a pig, when the gut, which contained a large number of worms, burst, and the contents splashed into his face. The oedema came on three or four hours later. When first seen by Mr. Snell, twenty-two hours later, the eyelids on both sides were intensely oedematous, projecting as large semitranslucent swellings, leaving only a chink between them. There was considerable chemosis of the conjunctiva. The next day the swelling had much subsided, and the day after the condition of the eyelids had almost passed away, though the conjunctiva remained red.

(Continued in next issue.)